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100080002-1

August 12, 1969

Reference: P-141

Air MailMailing Address

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To: U. S. Government

Attention: George M.

Subject: High Intensity Light Tables

Dear George,

Many thanks for the test report on our Model B High Intensity light table. We appreciate the many good things that were said about it.

Regarding the application of our film drive to the MIM-4 tables, we have gone almost as far as we can go without some access to a MIM-4. Do you know of any tables in the local Los Angeles area we may go and look at and measure?

We would like to check on the possibility of installing our motors as a direct replacement with no modifications to the existing table structure. Our greatest concern is with the ruggedness of the extrusion to which they clamp their motor brackets. If you could send us one of those extrusions, we could check this out.

We were pleased with the favorable comments on the lamp and dimmer but we are concerned that the measured data noted in the report was different from our measurements and from your previous measurements. As I remember, your man measured 2800 ft. L. at the high intensity setting with the Weston Foot-Lambert Meter when we brought the table into your place after the ASP show in March. Also, our meter, which you had calibrated against yours, showed 2800 ft. L.

NGA Review Complete

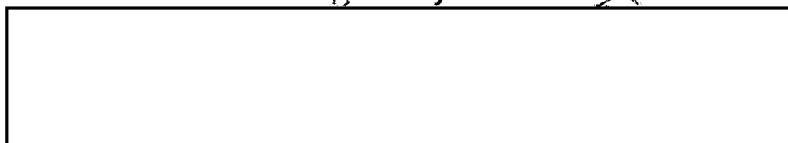
Would it be possible for you to recheck the light level measurements at 117v before sending the table back to us. We would like to get a tabulation of the readings and their location and not just the max., min, and average. A brief description of the test set up and meter settings would make the data more useful in our analysis.

Although your report indicates we have a good lamp, I think that some experimental work which takes off from where we are now would produce a better lamp. If so, you might consider refitting some of your existing tables with new lamps. Accordingly, I am enclosing herewith a proposal to conduct certain experimental work aimed at improving the lamp characteristics.

We propose a time and material task type contract with the same terms and conditions as our previous contract. Enclosure (a) to this letter is our technical proposal and enclosure (b) is our cost proposal.

We are looking forward to seeing you on your next trip West.

Best regards,



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Enclosures

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Enclosure (a)

## TECHNICAL PROPOSAL

### EXPERIMENTAL WORK FOR IMPROVEMENT OF LAMP PERFORMANCE for HIGH INTENSITY LIGHT TABLES

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1. Lamp: The lamp consists of:

- (a) Luminous Grid
- (b) Lamp Box
- (c) Diffuser
- (d) Dimmer
- (e) Transformer

Each of these items are candidates for improvement.

2. Goals:

- (a) Over a 10-inch by 20-inch viewing area, obtain a uniform 3000 ft.-lamberts or more brightness without use of blowers, coolant or other active means to maintain a cool viewing surface.
- (b) Obtain uniform dimming down to 100 ft.-lamberts or less without discernable flicker.
- (c) Limit temperature rise of viewing surface to 35°F or less at maximum intensity by heat sinks and convection.

- (d) Reduce the size and weight of the transformer required.
- (e) Most importantly, keep the manufacturing cost at a competitive level.

### 3. Description of Work

#### 3.1 Luminous Grids

Fabricate several luminous grids with phosphor coatings of higher conversion efficiency than the standard coatings. Fabricate two physically identical grids, one with a standard 3500 phosphor coating and one with a standard 5500 phosphor coating and compare performance with the grids with special phosphor coatings.

Fabricate one grid with the outer strands of different tube diameter than the interior strands thus producing brighter strands in order to minimize brightness fall off at the edge of the lamp.

#### 3.2 Lamp Box

Fabricate several lamp boxes with different ventilation patterns and heat sinks to achieve maximum heat dissipation with low fabrication cost. Examine the heat path from the luminous grid to the viewing surface and devise techniques for intercepting the path or increasing heat dissipation along the path.

Test several high efficiency diffuse reflectors for effectiveness in increasing brightness at the viewing surface.

### 3.3 Diffuser

Fabricate several diffusers with higher transmission efficiencies than the common 1/8-inch thick milk white plexiglass (identical to DuPont Lucite 2447). Compare performance of the diffusers for uniformity and intensity at the viewing surface.

### 3.4 Dimmer

Present dimmers work reasonably well at high intensity. One technique we will test however, is the insertion of a step-up transformer in the input power. Regardless of the lamp brightness achieved by other means, insertion of a step-up transformer will produce a higher intensity. It may be that the technique will only be useful for short term special situations and should be switched in and out by the operator. It may however, turn out to be a practical way to obtain high brightness levels.

Present dimmers use solid state components back to back to work on the full wave, which is both the positive and the negative halves of the alternating current power. We will construct a dimmer which will utilize either half wave or full wave of the input power as selected by the operator. Utilizing only the half wave will reduce the intensity by about half and thus at low levels will probably dim to about one-half of the 175 ft.-lamberts presently obtained or about 90 ft.-lamberts.

### 3.5 Transformer

The bulk and weight of the luminous tube transformers available for high intensity lamps present a difficult packaging job for light tables, especially the smaller portable tables. Transformer size

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is radically reduced as electrical power frequency is increased. The frequency of the electrical power can be increased by high frequency chopping. The techniques are similar to those used in dimmers. We will fabricate and test a 2000 cycle luminous tube transformer and a 2000 cycle chopper. We will make the frequency of the chopper variable however, in order to test the effect of various chopping frequencies.

4. Work Statement

- (a) Fabricate and test several luminous grids
- (b) Fabricate and test several lamp boxes and diffuse reflectors
- (c) Fabricate and test several diffusers
- (d) Fabricate and test a special dimmer and a step-up transformer.
- (e) Fabricate and test a high frequency chopper and a high frequency luminous tube transformer.
- (f) We require a calibrated foot-lambert meter as Customer furnished equipment.

5. Deliverable Items

- (a) Monthly Progress Reports, five (5) copies each. A narrative outlining technical effort accomplished during the period and pertinent administrative data.
- (b) Special Technical Reports, five (5) copies each. Reports of findings or items of special interest within the general scope of work as requested by the Contracting Officer or his Technical Representative.

- (c) Final Technical Report, five (5) copies each.  
A report of the findings of the experimental work including test data organized and summarized as pertinent and also including recommendations of the features to be included in an improved high intensity lamp.

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Enclosure (b)

### COST PROPOSAL

1.0 Information regarding the Cost Proposal.

1.1 The Cost Breakdown in support of this time and material task type proposal is included for your information in Table I.

1.2 This proposal is based upon the following additions:

1.2.1 Performance of work under a contract resulting from this proposal in accordance with the provision of the Technical Proposal Enclosure (a).

1.2.2 Terms Net 30 Days

1.2.3 Contractual provisions equivalent to those incorporated in a current time and material order by and between Offeror and Offeree.

1.2.4 Incorporation in the contractual instrument of an "Authorization and Consent" clause that will afford  the same measure of protection as that defined in ASPR9-102.1.

1.2.5 The price quoted does not include any Federal, State, Local or other taxes from which Intergraphic is exempt at the date of the attached proposal. If  must bear the burden of any taxes from which it was exempt at the date of this proposal, or any taxes enacted subsequent hereto but applied retroactively, the price of this proposal shall be adjusted accordingly.

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1.2.6 This proposal is on a time and material basis for a not to exceed contract dollar amount of [ ] for the services of Contractor personnel of the classifications and for the amount of hours as well as materials and subcontracts specified in Table I attached hereto.

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1.2.7 Performance of work under the contract resulting from this proposal shall be completed within 180 days from receipt and acceptance of contractual authority to proceed.

1.2.8 This proposal is firm for ninety (90) days from the date of this submittal.

## 2.0 Representations

2.1 [ ] certifies that the information contained in this proposal has been based upon, or compiled from the books and records of this company and is accurate to the best of our knowledge and belief.

2.2 [ ]

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2.3 The cost estimate does not include any charge for cost of facilities which duplicates any charge against any other prior or current government contract or subcontract, any depreciation on facilities or equipment owned by the government or any government agency, or any rental or use charge on facilities or equipment owned by the government, or any government agency.

2.4 [ ] has not employed or retained any company or person (other than a full time bonified employee working solely for the company) to solicit or secure this contract, and has not paid or agreed to pay any company or person (other than a full time bonified employee working solely for the company) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating thereto or requested by the Contracting Office.

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